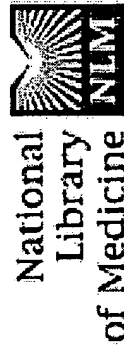




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## Safe performance of magnetic resonance imaging on five patients with permanent cardiac pacemakers.

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Five patients with permanent cardiac pacemakers (Pacemaker models 261, 285, 2016, 2020, 2022) underwent magnetic resonance imaging (MRI). Only one patient (underlying rhythm asystole) was pacemaker dependent. A variety of pacing configurations (single and dual chamber; unipolar and bipolar; sensor and nonsensor driven) were scanned. A thorough evaluation of each pacing system was performed before and after scanning including determination of pacing and sensing thresholds. During MRI the patient was monitored using either ECG, pulse oximetry, or direct voice contact. In four patients heavy dressings were applied over the pacemaker pocket site. Patients were asked to report any symptoms experienced during MRI. RESULTS: The four nonpacemaker dependent patients remained in sinus rhythm throughout the MRI. During and after the MRI all

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pacemakers continued to function normally except for one transient pause of approximately 2 seconds (noted by pulse oximeter) toward the end of the scan. This occurred in a pacemaker dependent patient with a unipolar dual chamber device programmed DOO. No patient experienced any torque or heat sensation. CONCLUSION: When appropriate strategies are used our experience suggests that MRI may be performed, when necessary, with an acceptable risk-benefit ratio to the patient. It is unclear whether the isolated pause that was observed was due to the effect of the MRI, an artifact with the monitoring system, or oversensing by the pacemaker. Appropriate patient selection, close monitoring during the scan, and follow-up after MRI are of paramount importance. Further study is necessary to refine the appropriate strategies that could be used to consistently perform MRI safely in a selected pacemaker population.

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